SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION APPLICATION EVALUATION AND CALCULATIONS	No. of Pages 11	Page No. 1
	Appl. No. 484374-376	Date July 20, 08
	Energy Team C. S. Bhatt	Approved by:

PERMIT TO CONSTRUCT/OPERATE

OWNER/OPERATOR: Aera Energy LLC

CONTACT: Ms. Susan Perrell

COMPANY ID: 104017

EQUIPMENT LOCATION: 20101 Goldenwest Street

Huntington Beach, CA 92648

EQUIPMENT DESCRIPTION:

A/N 484374:-

Alter the existing Crude oil/gas/water Separation System [Process 1, System 1, (P/O No. F82020, A/N 450152)] by the elimination of the standby mode of operation of tank T-317 [Device D14]

A/N 484375

Alter the existing Wastewater Treatment System [Process 1, System 2, (P/O No. F87065, A/N 458437)] by the elimination of the standby mode of operation of tank T-317 [Device D14]

A/N 484376:- Update the Facility Permit as per the above change.

Section D: Facility Description and Equipment Specific Conditions

DESCRIPTION	ID No.	Connected to	Source Type/ Monitoring Unit	Emission	Conditions/ comments
Process 1 (Crude Oil/Gas Production), **System 1 (Crude oil/gas/water Separation)**					
Vessel, V-104, Free water knockout, 10' D x 40' L A/N ~~450152~~ 484374	D1				~~I30.1~~
Vessel, V-107, Free water knockout, 12' D x 60' L A/N ~~450152~~ 484374	D2				~~I30.1~~
Vessel, V-108, Free water knockout, 12' D x 60' L A/N ~~450152~~ 484374	D3				~~I30.1~~
Vessel, V-109, Free water knockout, 12' D x 60' L A/N ~~450152~~ 484374	D4				~~I30.1~~
Vessel, V-110, Free water knockout, 12' D x 60' L. A/N ~~450152~~ 484374	D5				~~I30.1~~
Vessel, V-111, Free water knockout, 10' D x 60' L. A/N ~~450152~~ 484374	D6				~~I30.1~~
Vessel, V-114, Free water knockout, 12' D x 40' L. A/N ~~450152~~ 484374	D7				
Vessel, V-115, Free water knockout, 12' D x 60' L. A/N ~~450152~~ 484374	D8				~~I30.1~~
Tank, Holding, T-101, Crude Oil, vented to Vapor Recovery Compressor, 2,000 bbl, 29' – 9" D x 16' H., A/N ~~450152~~ 484374	D10				E57.1, E127.1, H23.5, ~~I30.1~~
Tank, Holding, T-102, Crude Oil, vented to Vapor Recovery Compressor, 2,000 bbl, 29' – 9" D x 16' H., A/N ~~450152~~ 484374	D11				E57.1, E127.1, H23.5, ~~I30.1~~
Tank, Holding, T-103, Wet Oil Divert, vented to Vapor Recovery Compressor, 2,000 bbl, 29' – 9" D x 16' H.. A/N ~~450152~~ 484374	D12				E57.1, E127.1, H23.5, ~~I30.1~~

Section D: Facility Description and Equipment Specific Conditions

DESCRIPTION	ID No.	Connected to	Source Type/ Monitoring Unit	Emission	Conditions/ comments
Process 1 (Crude Oil/Gas Production) System 1 (Crude oil/gas/water Separation)					
Tank, Holding, T-104, Wet Oil Divert, vented to Vapor Recovery Compressor, 2,000 bbl 29' – 9" D x 16' H., A/N ~~450152~~ 484374	D13				E57.1, E127.1, H23.5, ~~I30.1~~
Tank, Holding, T-318, Skim Oil, vented to Vapor Recovery Compressor, 5,000 bbl 38' – 8" D x 24' H. A/N ~~450152~~ 484374	D15				E57.1, E127.1, H23.5, ~~I30.1~~
Pit, No. 1,Covered, Wet Oil, vented to Vapor Recovery Compressor, 59' – 6" L. x 40' – 6" W. A/N ~~450152~~ 484374	D17				E57.1, H23.4, ~~I30.1~~
Vessel, Separator, V-150, Relief Knockout Drum, 10' D x 40' L. A/N ~~450152~~ 484374	D41				H23.3
Tank, T-317, ~~Stand-by~~ Surge/ Skim Oil-Wastewater, vented to Vapor Recovery Compressor, 5,000 bbl 38' – 8" D x 24' H. A/N ~~450152~~ 484374	D14				E57.1, E127.1, ~~E193.1~~, H23.5, ~~I30.1~~

The above equipment description is as per the existing permit (P/O F82020, A/.N 450152) and the proposed modification done as per A/No. 484374

Section D: Facility Description and Equipment Specific Conditions

DESCRIPTION	ID No.	Connected to	Source Type/ Monitoring Unit	Emission	Conditions/ comments
Process 1 (Crude Oil/Gas Production), System 2 (Wastewater Treatment)					
Floatation Unit, Wemco, T-337, vented to Vapor Recovery Compressor, 550 bbl A/N ~~458437~~ 484375	D23				E127.1, H23.4, ~~I30.1~~
Floatation Unit, Wemco, T-338, vented to Vapor Recovery Compressor, 550 bbl A/N ~~458437~~ 484375	D24				E127.1, H23.4, ~~I30.1~~
Tank, T-317, ~~Stand-by~~ Surge/Skim Oil-Wastewater, vented to Vapor Recovery Compressor, 5,000 bbl 38' – 8" D x 24' H., A/N ~~458437~~ 484375	D14				E57.1, E127.1, ~~E193.1~~, H23.5, ~~I30.1~~
Tank, Holding, T-350, Injection Water, vented to Vapor Recovery Compressor, 5,000 bbl 38' – 8" D x 24' H., A/N ~~458437~~ 484375	D215				E57.1, E127.1, H23.5, ~~I30.1~~
Tank, storage, T-326, Rain Water, 2,300 bbl 29' D x 20' H A/N ~~458437~~ 484375	D28				~~I30.1~~
Tank, storage, T-327, Rain Water, 2,300 bbl 29' D x 20' H A/N ~~458437~~ 484375	D29				~~I30.1~~
Tank, storage, T-328, Rain Water, 2,300 bbl 29' D x 20' H A/N ~~458437~~ 484375	D30				~~I30.1~~
Tank, storage, T-360, Rain Water, 2,000 bbl 29' – 9" D x 16' H A/N ~~458437~~ 484375	D34				~~I30.1~~
Oil Water Separator, T-339, 1,000 bbl capacity, vented to Vapor Recovery Compressor, 12' Dia. x 60' L. A/N ~~458437~~ 484375	D36				E57.1, E127.1, H23.7, ~~I30.1~~
Pit, No. 3, Covered, Skim Oil, vented to Vapor Recovery Compressor A/N ~~458437~~ 484375	D40				E57.1, H23.4, ~~I30.1~~

Section D: Facility Description and Equipment Specific Conditions

DESCRIPTION	ID No.	Connected to	Source Type/ Monitoring Unit	Emission	Conditions/ comments
Process 1 (Crude Oil/Gas Production), System 2 (Wastewater Treatment)					
Tank, Vacuum Truck Offloading, T-340, Oily Water, vented to Vapor Recovery Compressor, 180 bbl, 12' D x 15' – 1" H. A/N ~~458437~~ 484375	D216				E57.1, E127.1, H23.3, ~~I30.1~~
Tank, Vacuum Truck Offloading, , T-341, Oily Water, vented to Vapor Recovery Compressor, 180 bbl, 12' D x 15' – 1" H. A/N ~~458437~~ 484375	D217				E57.1, E127.1, H23.3, ~~I30.1~~
Tank, Holding, T-342, Oily Water, vented to Vapor Recovery Compressor, 1,000 bbl, 29' – 9" D x 8' H. A/N ~~458437~~ 484375	D218				E57.1, E127.1, H23.5, ~~I30.1~~
Tank, Holding, T-343, Oily Water, vented to Vapor Recovery Compressor, 1,000 bbl, 29' – 9" D x 8' H. A/N ~~458437~~ 484375	D219				E57.1, E127.1, H23.5, ~~I30.1~~
Tank, Holding, T-345, Process Drain/Rain Water, Sump Drain, vented to Vapor Recovery Compressor , 53 bbl, 12' L. x 5 W. x 5 H. A/N ~~458437~~ 484375	D220				E57.1, E127.1, ~~I30.1~~

The above equipment description is as per the existing permit (P/O F87065, A/N 458437) and the proposed modification done as per A/No. 484375. The above description is give for information only. For the actual permit wordingand equipment description, please see the draft facility permit.

BACKGROUND:

Aera Energy operates the crude oil and gas production facility at the above location and has filed the above two applications to modify the existing crude oil/gas/water separation (P/O No. F82020 (A/N 450152)) and wastewater treatment unit permit (permit No. F87065 (A/N 458437)). The modification calls for elimination of standby mode of operation of Tank T-317 (device D14) which will now operate either as skim oil tank under oil water separation system or as a surge tank under wastewater treatment system. This is to enhance the production flexibility and maintenance. There will be no new piping and fugitive components due to the proposed change in mode of operation of tank T-317 (D14). Consequently permit condition E193.1 is eliminated. Permit condition I30.1 is eliminated as Aera is now a Title V facility. These are Class I applications and a P/C – P/Os will be issued.

A/N 484376 is filed to update the facility permit.

PROCESS DESCRIPTION:

This is a typical crude oil production facility. The above-proposed change in mode of operation of tank T-317 (D14) will not alter the basic operations of crude oil/gas/water separation and wastewater treatment processes. The proposed modifications will improve the process operations and equipment maintenance. The basic process is as shown below:

Oil and water from the facility's oil well enters the free water knockouts where oil and water are separated by gravity. The commingled oil stream goes to oil holding tanks form where it is shipped by pipeline. The water stream goes to the 5,000 bbl skim oil tank (T-318) where additional oil is removed by gravity separation. The recovered oil from the top goes to the holding tank and the water from this skim tank is sent to wemco floatation cells (devices D23 and D24) for the fine oil removal step. The clean water from the wemco will go to the recently installed new tank T-350. Injection charge pumps transfer water from the surge tank to high pressure injection pumps which then send the water to a network of injection wells where it is returned to subsurface oil reservoir to maintain reservoir pressure and to enhance the oil recovery.

Skim Pit 3 (device D40) receives oily water from flotation cells, from various facility process drains and from vacuum truck operation. Oil separated due to gravity is sent back to main process system via skim oil tank and water is sent to secondary water injection system. The two 180-bbl tanks [D216, D217] receive oily water from vacuum truck operation (diverted from Skim Pit 3) and capture solids (sands, dirt etc.) to improve the quality of injection water and to avoid accumulation in skim pit 3. These tanks are connected to vapor recovery system..

The two 1000-bbl tanks [device D218, D219] operate in parallel and receive oily water from the sources which currently go to Skim Pit 3. This configuration provides Aera the ability to temporarily remove Skim Pit 3 from service for cleaning and inspection without interrupting continuous oil/gas production operations. The sump tank (device D220) receives process drains and rainwater from the containment areas. The 1000-bbl tanks and the sump tank are connected vapor recovery system.

For detailed description, please see the process block flow diagrams in the permit folder. The crude oil/ gas/water separation and wastewater treatment systems operate 24hrs/day, 7 days/week and 365 days per year.

EMISSION CALCULATIONS:

The proposed modification in mode of operation of Tank T-317 [from standby to full lime service either as a skim oil tank or as a water injection surge tank] will result in ROG as well as toxic emission increase. There will be no change in fugitive emission as no new components are added.

This tank will be either in Skim oil operation or in the wastewater service. For emission calculations, the worst case scenario [skim oil service] is used. For a constant temperature tank Breathing loss is zero and for the pulsating tank (slight level change), tank turnover rate is 4 as per the Tank 4.09d guideline.

Applicant has used EPA TANKS 4.09d program to estimate the emission of tank T-317 and per the program output the uncontrolled ROG emissions will be 1,843 lbs/yr [5.05 lbs/day 0.210 lb/hr]. Tank T-317 is connected to vapor recovery system [95% controlled efficiency] and thus the controlled ROG emissions will be 92 lbs/yr [0.252 lb/day, 0.0105 lb/hr].

Existing permit unit emissions [crude oil /gas/water separation, P/O No. F82020] from the database

Permit unit emission summary after the modification:

Pollutant	lb/hr		lb/day		30-day Avg	lb/y
	Uncntrl.	Cntrl	Uncntrl	Cntrl.	Cntrl.	controlled
ROG [Existing P/O F82020]	47.52	2.42	1,140.48	58.32	59.00	21,245
Tank T-317 Emission	0.210	0.0105	5.05	0.252	0.0	92
Total Emission (after modif.)	47.73	2.4305	1,145.53	58.572	59.0	21,337

Tank's emission check per District's Storage tank Guidelines

Toxic Emissions from operation of Tank T-317:

Toxic Emissions from Tank 317's ROG emissions:

Toxicant	Mol. Wt.	Concn.		Toxicant's Emission		
		ppmv	Ppmw	lb/hr	lb/day	lb/yr
Benzene	78.11	105.79	414.9	4.36E-06	1.05E-04	3.82E-02
Ethyl Benzene	106.16	5.47	29.2	3.07E-07	7.36E-06	2.69E-03
Hexane	86.17	72.6	314.1	3.30E-06	7.92E-05	2.89E-02
H_2S	34.08	4000	6844.4	7.19E-05	1.73E-03	6.30E-01
Toluene	92.13	68.96	319.0	3.35E-06	8.04E-05	2.93E-02
Xylene	106.16	1.63	8.7	9.14E-08	2.19E-06	8.00E-04

MW of produce gas = 19.917 Total ROG/TOG losses from T-317 = **92 lbs/yr [0.252 lb/day 0.0105 lb/hr]**

ppmw = ppmv x (MW component/MW produce gas) lbs of TAC = $ppmw_{TAC}$ x (emission from tank)

The above data is from applicant's submittal package, Table 3-2 (May 2007 Application Package and as per the analysis of the field gas.

Tier 1 Health Risk Analysis:

Since there is an increase in toxicants' emissions (due to fugitive emissions from new components and 4 new tanks), R-1401 analysis is required to verify cancer risk and chronic and acute health indices. The near by residential source is 150 meters away, however, for conservative approach **100 meter** is used to estimate health risks.

Toxicant	R-1401 Screening Levels		Project Emission		Pollutant Screening Index	
	Chronic	Acute	lbs/yr	lbhr	Chronic	Acute
Benzene	8.92E+00	3.96E+00	3.82E-02	4.36E-06	4.28E-03	1.10E-06
Ethyl Benzene	5.17E+05	N/A	2.69E-03	3.07E-07	5.20E-09	N/A
Hexane	1.81E+06	N/A	2.89E-02	3.30E-06	1.60E-08	N/A
H_2S	2.58E+03	1.12E-01	6.30E-01	7.19E-05	2.44E-04	6.42E-04
Toluene	7.75E+04	9.91E+01	2.93E-02	3.35E-06	3.78E-07	3.38E-08
Xylene	1.81E+05	5.89E+01	8.00E-04	9.14E-08	4.42E-09	1.55E-09
Application Screening Index [summation of all pollutant Screening Index]					0.00452	0.000642

Screening Emission Level data from Table 1A, of R-1401 Risk Assessment Procedure

Pollutant Screening Index ($PSI_{Chronic}$) = Qyr/Pollutant Screening Level
Pollutant Screening Index (PSI_{Acute}) = Qhr/Pollutant Screening Level
The ASI (summation of each individual toxicant's PSIs for all chronic and acute toxicant) is less than one for both acute and chronic compounds.

Since ASIs for all chronic and acute components are less than one, no further risk analysis is done.

RULES EVALUATION:

CEQA: The proposed modification of crude oil gas separation and wastewater treatment units results in ROG emission increase of 92 lbs/yr from the modified tank T-317. Review of the 400 – CEQA Form indicates that there is no need for further CEQA analysis.

RULE 212: STANDARDS FOR APPROVING PERMITS: The increase in ROG emission (0.252 lb/day) from the modified tank T-317 of the crude oil/gas separation and wastewater treatment units is less than limit of rule subsection (g) and as per Tier I toxic analysis there is no increase in MICR. Also, this facility is not located within 1000 feet from the outer boundary of a school. Thus, no public notice is required.

RULE 401: VISIBLE EMISSIONS: With proper operation visible emissions are not expected.

RULE 402: NUISANCE: With proper operation, nuisance complaints are not expected.

RULE 463: All required fixed roof tanks are connected to vapor recovery system as per R-463 (c) (3). The ROG emission increase from the modified tank T-317 is less than a lb/day and it is connected to VRS.

RULE 1113: Compliance is expected.

RULE 1173: Aera Energy employs required inspection and maintenance and records keeping program for all applicable fugitive components.

RULE 1176: There are no primary or secondary sumps or open wastewater separators at this facility.

REG XIII: NEW SOURCE REVIEW: The proposed modification of the crude oil/gas separation and wastewater treatment units is done to improve plant's maintenance and equipment operation. The sole purpose is to have operational flexibility during inspection and repair without disrupting the crude oil production. The proposed modification results in emission increase of 92 lbs/yr which is less than 1 lb/day. Thus, no BACT requirements are triggered. At present, there is no modeling requirement for ROG emissions.

RULE 1401: NEW SOURCE REVIEW OF CARCINOGENIC AIR CONTAMINANTS: Since there is an increase in toxicants' emission due to increase in ROG emissions, R-1401 Tier 1 analysis was performed. As per this analysis, the Application Screening Index is less than one for both chronic and acute exposures. Since the PSI is less than one, MICR is presumed to be less than one in a million and satisfies the rule requirements.

Reg. XVII: Prevention of Significant Deterioration

The proposed amendment results in slight increase of ROG emissions [92 lbs/yr (0.252 lbs/day)] which is a non-attainment pollutant and not subject to PSD requirements.

Rule 2004: The facility is in NOx RECLAIM Cycle 1, rule compliance is expected.

Rule 2005: Modification of crude oil/gas separation and wastewater treatment units does not impact any RECLAIM pollutant.

Rule 2012: The facility is in NOx RECLAIM and is complying with all monitoring, reporting and record keeping requirements of this rule. Compliance is expected. Proposed alterations do not impact rule compliance.

Reg. XXX: Aera Energy is a Title V facility and the proposed modification of Tank T-317 is a minor modification (ROG emission increase of 0.25 lb/day) of their Title V facility permit as per R-3000 (12). Thus, Aera has submitted A/N 484376 to amend their Title V permit as per R-3003 (i)(4)(A). This being a minor revision, public participation under R-3006 is not required as shown under R-3003(i)(4)(B) requirements. Aera Energy's facility is not located within 50 miles of a nearby state and thus no notification is required as shown under R-3003 (i)(4)(C).

Reg. XXX: As stated under R-3003 (i)(4)(D), Aera's facility permit conditions provide for compliance with all regulatory requirements, EPA administrator will be sent a copy of the revised permit for its 45-day review as per R-3003 (i)(4)(E).

R-3003 (j): The revised permit will be sent to EPA for a 45-day review period as required by the rule subsection.

R-3003(m): Aera's facility is not located within 50 miles of a nearby state.

R-3006: public participation is not required as this modification is exempt under rule subsection (b).

RECOMMENDATION AND PERMIT CONDITIONS:

The wastewater unit will be in compliance with all applicable Rules and Regulations of the South Coast Air Quality Management District. A Permit to Construct/Operate is recommended, subject to the following listed conditions:

- PERMIT CONDITIONS –

The following conditions from RECLAIM Condition Library will be added/updated to the facility's permit.

E57.1 The operator shall vent this equipment to vapor recovery system whenever this equipment is operating. [R-1303 BACT]

E127.1 The operator shall keep gauge/sample hatches closed except during actual gauging/sampling operations. [R-1303-BACT]

~~E193.1 The operator shall operate and maintain this equipment following requirements:~~

~~The operator shall only use tank T-317 (device D14) if either tank T-318 (device D15) or tank T-350 (device D215) is not in operation.~~

~~[R1303 (b)(2) offsets]~~

H23.5 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	463
VOC	District Rule	1149
VOC	District Rule	464
VOC	District Rule	1173

[R-463, R-464, R-1149, R-1173]

~~I30.1 In accordance with Rule 3002 (a)(3), the permit for this equipment is being issued as a non-Title V permit. The facility permit holder shall file an application for a Title V permit revision for this equipment within 90 days of the issuance of the facility's initial Title V permit.~~

K67.5 The operator shall keep records of the temperature of Tank T-317.

Please see the facility permit for detailed permit condition description.